2001

Life Sciences Institute for High School Students and Teachers

The Grace E. Harris Leadership Institute at Virginia Commonwealth University
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Life Sciences Institute for High School Students and Teachers

Grace Harris Leadership Institute
Team 5 Project
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Team Vision: *To become leaders who inspire leadership in others.*

Team Mission: *To develop leadership knowledge and abilities and a collaborative partnership to influence VCU's achievement of its vision.*

Project Description

A two-day institute will be developed and presented on campus in late fall or early spring semester for selected high school students and teachers. The program content and activities will be designed to focus on a theme within the Life Sciences. Each year a theme will be selected in consideration of all the programs and schools associated with the Life Sciences Initiative at VCU. This includes biology, genetics, health-care sciences, the behavioral sciences, and the integration of arts and social sciences as feasible.

The institute will lead to high school students earning one undergraduate credit and teachers will earn one graduate credit for continuing education or advanced study. The program is designed to attract students to attend VCU for the Life Sciences. The high school teachers will serve as student sponsors and potential recruiters for students at their local high schools. The learning experiences will be designed so teachers can incorporate Life Sciences' content into their high school classrooms.

Given the team's vision and mission, the proposed project is designed to enhance collaborative efforts among the Life Science disciplines and university outreach to high schools within and outside of Virginia.

Background Information, Statement of the Issues

VCU's Life Science Initiative is a university wide endeavor to build, strengthen and collaborate its education and scholarship around the Life Sciences. It is an opportunity to unite the academic and medical campus to study biological complexity. As the Life Sciences develop at VCU, marketing and recruitment efforts must be created that will attract qualified students. Consistent with VCU's mission, the proposed Life Sciences Institute for High School Students and Teachers will support university outreach to attract qualified out of state students for education in the Life Sciences.

The proposed two-day on campus institute is an opportunity to showcase the Life Science disciplines as annual themes. Continued participation in the institute would become an anticipated annual event for high school students and teachers. Additionally, it is an opportunity

to include all the Life Science disciplines within the university community. The unique collaboration among the varying disciplines will develop creative themes to focus the annual program content and activities.

Project Details

Goals

There are three goals for the Institute. These goals are listed below.

Goal #1: To educate high school students and teachers in the life sciences.

Goal #2: To recruit qualified undergraduate students to VCU to study the life sciences.

Goal #3: To provide an avenue for broad based faculty participation in life science education.

Target Population

High school students (usually juniors, some sophomores) with excellent academic qualifications from the Northeast including Northern Virginia, DC and Maryland and the Tidewater region, North Carolina, Eastern Tennessee, West Virginia and Richmond would be targeted for participation in the Life Sciences Institute. The project also targets high school science teachers in these regions by including them in the project. Students participating in the project will be designated “Future Scholars in Life Sciences.”

Methods

The Life Sciences Institute will be an annual event that is offered as an on-campus institute for high school students and faculty. The program announcement will be mailed to every high school located in the designated area during the spring semester. A follow-up letter will be forwarded in the fall giving the final details for the scheduled event. Names of students and faculty will be submitted by the deadline. Efforts will be made to attract students from a wide variety of schools from diverse geographic areas. The project is intended to increase out of state enrollment.

Interested high schools may submit up to five names of students (minimum of two per school) for participation. Students who meet general project criteria for academic excellence are selected by their schools to attend the Institute. Students must demonstrate the potential for careers in the life sciences. The selection process will be determined by the local high schools and names of students are forwarded for participation. **A** minimum of 100 students and 50 faculty will be invited annually.

The Institute will focus on an annual theme within the life sciences, will be offered for two days and provide academic credit for high school students and their teachers. The requirements for the one-credit offerings (one graduate and undergraduate) will be determined

and will include follow-up assignments to be returned via e-mail. The Institute will include faculty from a variety of disciplines within Virginia Commonwealth including the biobehavioral and applied sciences. The class modules will be held concurrently for students and teachers.

Students will be hosted in dorms by (1) honors students or (2) graduate students in the doctoral, master's or professional programs associated with behavioral and life sciences. This would place VCU students in the position of "selling" the program, and may strengthen their loyalty to VCU. High school teachers who attend would be given a housing allowance.

A planning committee will be established including members of Team 5 of the Grace E. Harris Leadership Institute. Team 5 will forward the project overview to the Planning Committee. The activities of Team 5 and the Planning Committee are described below.

a. Programs/department/schools that are currently participating in the Life Sciences Initiative will be contacted and asked to contribute ideas for potential content, learning activities and faculty resources.
b. Programs that are not directly involved in the Initiative will be contacted by the Planning Committee to determine their interest. The potential involvement of biobehavioral and applied disciplines would include examples of educational modules, research projects, faculty expertise and related discipline knowledge. This information would be documented for future planning.
c. The structure and the logistics of the Institute will be delegated to the appropriate VCU administrative offices for implementation including admissions and registration, housing, honors program, student activities as well as faculty and staff in the participating departments.
d. The resources required will be determined after the proposed curriculum is complete. This information will be maintained by the University Planning Committee for future implementation.
e. The appropriateness of content for high school students and science teachers will be determined in consultation with local science teachers, faculty within the School of Education and the directors of other VCU high school outreach programs.
f. The Institute would take place over a weekend in the fall or early spring semester. The Institute will consider the school calendar and be timed early enough to influence the students' choice for college.
g. The Institute will be evaluated by student and teacher participants as well as VCU faculty participating. These data would be available for the following year's Planning Committee and to solicit donor support.
h. The names of all participants will be forwarded to undergraduate admissions for mailing of VCU materials and marketing materials for 18 months following the Institute. It is anticipated that there would be multiple contacts with these students over this period of time.
i. The rate of application and admissions among the students will be monitored and reported as part of the evaluation of the effectiveness of the Institute. The continuing participation of schools over time will be monitored as well.

j. The design of the Institute will be shared with administrators within VCU to solicit financial support for the first year of the project. Dr. Peter Wythe, Vice President for Advancement will be invited to participate in seeking future donor funding/endowment.

Implementation Plan

A. Preliminary Activities already done by Team 5 of the Grace Harris Institute

1. Exploration of interest in the project:
   - Met with Dr. Sue Ann Messmer, Vice Provost and Dr. Heber Newsome, Dean of the School of Medicine
   - Met with Dr. Huff, Interim Vice Provost for Life Sciences
   - Met with Executive Committee of the Life Sciences Initiative
   - Met with science supervisors of county school systems
   - Met with Dr. Peter Wythe regarding the budget for the project
   - Met with Dr. Joe Chinnici, Coordinator of Life Sciences 101
   - Worked with Dr. Richard Rezba to submit a proposal to the Virginia Education Association meeting for Spring 2002

2. Developed the project overview, an initial schedule and a template for a curriculum for the Institute (see Appendix A)

3. Developed a preliminary budget (see Appendix B)

B. Post-approval Implementation

A planning committee will be established to oversee implementation of the project. The following are suggested activities:

1. Develop the curriculum for the Life Sciences Institute
   - Review the curriculum template developed by Team 5
   - Meet with Deans and Department Chairs
   - Meet with Dr. Joe Chinnici, Coordinator of Life Sciences 101
   - Meet with interested faculty to solicit ideas about content and to explore interest in participating in the Institute
   - Meet with high school science teachers or selected teachers in the Richmond metropolitan area.
   - Consult with faculty and staff knowledgeable of high school recruitment programs
2. Forward a preliminary curriculum to directors of on-going student initiatives, faculty in the School of Education, and Life Sciences participating faculty for review.
3. Refine the budget and list of potential internal funding sources for the initial year
4. Develop general criteria and guidelines for the selection of “Future Scholars in Life Sciences” (high school students)

5. Pilot test the Institute Curriculum with students from Philadelphia area
6. Solicit potential donors to support future offerings of the annual event
7. Develop a marketing and evaluation plan for the Life Sciences Institute

Available Resources

The pilot project will probably be fully covered internally to VCU. The planned project will need to be endowed. Gifts for endowment would be solicited from a private donor or Foundation at the rate of 20 times the cost of carrying out the program.

Evaluation Plan

Project evaluation will be conducted on an annual basis by the persons or groups responsible for implementation. Evaluation will be a based on stated goals. The evaluation report will be submitted to the Provost and to the Life Sciences Initiative Executive Board.

Goals will be evaluated as follows:

Goals	*Outcomes and Standard*	*Evaluation Period*
Goal 1: To educate high school students and teachers in the life sciences.	80% of participants will earn college credit	Yearly
Goal 2: To recruit qualified undergraduate students to VCU to study the life sciences.	15% of high school student attendees will enroll at VCU	Yearly
Goal 3: To provide an avenue for broad based faculty participation in life science education.	Faculty from both campuses and multiple disciplines will participate in the Institute	Yearly

Appendix A: Sample Format of Life Science Institute

Students will be introduced to the Life Sciences at VCU in a two-day institute. This would include both information (as the students are exposed to the cutting-edge of research that is going on at VCU) and experiential activities. VCU faculty will make presentations, give talks, have students tour labs and facilities, put students together for active discussions or debates, and create an interesting and motivating experience.

The main task is to motivate students to be interested in the exciting things associated with the life sciences, broadly defined. A secondary theme will be that VCU is on the cutting edge of the life sciences. This learning opportunity provides students with the chance to interact or at least hear and meet some of the leading scientists in the country whose work will be critical during the 21st century.

Examples of Speakers and Activities

- Tom Huff for a short overview of the life sciences.
- Joe Chinnici to talk about getting into the life sciences at the freshman level and the Life Sciences 101 course.
- Bob Balster or Billy Martin might talk about psychopharmacology and research in drug use and abuse from the animal model-level to research with addicted humans.
- Lindon Eaves and Ken Kendler might talk about behavioral genetics and its methodology and role in revealing the power of genes and environment (and their interaction) in behavior from psychiatric problems to religion to health behavior.
- Susan Kornstein might talk about her research into drugs and treatments for psychiatric disorders and the opportunities for women in the life sciences.
- Anthony Guiseppe-Eli could discuss biotechnology and biomedical engineering.
- Ron Merrell could talk about an exciting advance in health care, including robotics.
- Judy Lewis could discuss ethical issues in the human genome project.
- Al Farrell, one of four PIs in the United States' largest violence-prevention in the schools might talk about how the applied behavioral scientist deals with a life-threatening social problem through research.
- Frank Macrina could discuss the function of microbiological study in the development of health care research.
- Richard Toscan to talk about the interface of art and health education.

- Nancy McCain and a team of nurse researchers to explore the interaction of mind, body, and spirit on the physiology of HIV disease.

Tours of Facilities

Besides bringing in such a wide variety of experts who are known not only for their research but also for their teaching, students will be exposed to how science is done. They will tour:

- the Trani & Trani Life Sciences Building.
- the Rice Center on the James River.
- the biotech park.
- two labs, one on the East and one on the West Campuses
    - Greg Buck's bio-informatics lab.
    - Suzanne Barbour's bench science lab.
    - New lab in engineering.
    - New lab in the Trani & Trani Building.

Fun and Free Time

Students will spend the night in a dormitory with a current student at VCU.

Students and Teachers will attend a banquet on the first night. There will be an entertaining, informative speaker, dance or drama presentations, a visual presentation of Life Sciences at VCU, and perhaps music from a local band.

Meals will be box lunches (both lunches). Continental breakfasts will be provided.

Educational Activities and Grading

Students will listen to two back-to-back talks taking different points of view on a controversial topic--for example cloning humans or stem-cell research--and will break into discussion groups to talk about the issues raised in the "debate." Students will have to submit a paper (25 percent of the grade) on the issue by one month from the end of the course to receive college credit.

Students will also write an essay on the topic they found to be most interesting from the weekend (25 percent of the grade).

The remainder of the grade (50 percent) is participation in the weekend.

Tentative Time Schedule with Some Example Activities

Time	Event
Friday	
8:00-9:00	Check in; donuts and juice
9:00-9:50	Welcome; Plenary session
10:00-12:00	Tour of Trani & Trani Building
12:00-1:00	Box lunch
1:00-2:30	Debate and small-group discussions
3:00-4:00	Plenary session
4:00-5:00	Break-out sessions at Trani & Trani Building
5:00-6:00	Plenary session
7:00-9:30	Banquet with entertainment and speaker
Saturday	
9:00-10:00	Plenary
10:00-1:00	Road Trip to Rice Center; box lunch provided at Rice Center
1:00-1:30	Return to VCU
1:30-2:30	Plenary
2:30-4:00	Tour of Biotech Park
4:00-5:00	Choice of labs to tour
5:00-5:30	Plenary for discussion of projects; adjourn

Teaching in the Life Sciences

There will be parallel sessions for the teachers. Teachers will also hear the talks given to the students by the nationally known researchers. Other activities would include (a) meetings to discuss the content and (b) meetings to discuss the style of pedagogy that the researchers (who are also known for teaching) used in conveying technical material to the students. These additional activities would be conducted by faculty in the School of Education and concentrate on how the teachers might incorporate the learning of the weekend into their curriculum back at their home schools.

Educational Activities and Grading

Teachers will write at least two lesson plans that incorporate content covered at the Institute. They will have to submit the written plans (50 percent of the grade) by one month from the end of the course to receive graduate credit.

The remainder of the grade (50 percent) is participation in the weekend.

Tentative Time Schedule with Some Example Activities

Time	Event
Friday	
8:00-9:00	Check in; Continental breakfast
9:00-9:50	Welcome; Plenary session
10:00-12:00	Tour of Trani & Trani Building
12:00-1:00	Box lunch
1:00-2:30	30-minute presentation and group discussion of pedagogy in the Life Sciences (Teachers only)
3:00-4:00	Plenary session
4:00-5:00	Break-out sessions at Trani & Trani Building
5:00-6:00	Plenary session
7:00-9:30	Banquet with entertainment and speaker
Saturday	
8:00-9:00	Continental breakfast
9:00-10:00	Plenary
10:00-1:00	Road Trip to Rice Center; box lunch provided at Rice Center
1:00-1:30	Return to VCU
1:30-2:30	Plenary
2:30-4:00	Tour of Biotech Park
4:00-5:00	Group discussion about curriculum implementation in the home school
5:00-5:30	Discussion of projects; adjourn

Appendix B: Proposed Budget

Item	*Estimated Cost*
Travel Awards for Each Driver (150 @ $ 100)	$15,000
Lodging for Faculty (50 @ $130 for 2 nights)	$ 6,500
Tuition for 100 students (100 x $106)	$10,600
Tuition for 50 teachers (50 x $106)**	$ 5,300**
Certificates for Student Leader-Scholars (100 @ $2)	$ 200
Continental Breakfast (2 mornings – 350@ $4)	$ 1,400
Box lunch each day for 200 @ $8	$ 1,600
Banquet first night for 225 @ $25	$ 5,625
Filming and Editing film**	$ 3,000**
Advertisement**	$ 4,000**
Miscellaneous Expenses	$ 5,000
Total Expenses per Year	$45,925 (+ $12,300**)
Total Costs	$58,225